



CITY OF SAN ANTONIO

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BACKFLOW PREVENTION ASSEMBLY INSTALLATION STANDARDS

All backflow prevention assembly installations shall be in accordance with the following standards unless otherwise directed or approved by the Development Service Department and the U.P.C. These instructions are general guidelines and are subject to change without notice. Any inquiries or request should be directed to the Plumbing Inspection Division at (210) 207-8279.

GENERAL INSTRUCTIONS

1. Assemblies will be installed in an accessible location to facilitate maintenance, testing and repair and should never be located more than five feet above the floor or grade level. The backflow preventer must be installed at the equipment unless otherwise approved. In no instance will the assembly be allowed in the same vault with the San Antonio Water System (SAWS) water meter.
2. Vault lids will be constructed in such a manner as to permit easy accessibility at all times by an individual. Vaults deeper than 5 feet shall be provided with a ladder permanently attached to a side wall. It is the contractor's and owner's obligation and responsibility to ensure OSHA regulations are adhered to in the construction of all vaults. Additionally, confined space regulations are to be consulted and followed in the testing and maintenance of backflow prevention assemblies.
3. Before installing the assembly, pipelines should be thoroughly flushed to remove foreign material.
4. Test cocks must never be used as supply connections and must be plugged except when being tested. Plugs must be non-ferrous, e.g., brass, plastic, etc. Backflow preventers must be installed horizontally and in an upright position, unless full approval has been obtained from the University of Southern California or the American Water Works Association. Future testing and repair on backflow prevention assemblies require the indicated clearances to be provided regardless of the test cocks locations except for 1" or smaller double check valve assemblies that are repairable from the top, have test cocks on top of the assembly and not installed in concrete or asphalt.
5. All hot water heating systems should be evaluated before the backflow prevention assembly is installed to ensure that the temperature and pressure relief valves have been properly installed and are in working condition. Future backflow prevention assembly test should also include the testing of pressure relief valves.
6. In order to ensure that backflow prevention assemblies continue to operate satisfactorily, it will be necessary that they be tested at the time of installation and on an annual basis thereafter. Such test will be conducted in accordance with performance standards and field test procedures as prescribed by the American Water Works Association or the University of Southern California. The Backflow Prevention Section shall provide appropriate "test and maintenance" report forms. The completed test and maintenance report shall be submitted to the Development Services Dept for record keeping and processing.
7. All cost entailed in the subject program are to be borne by the customer. This includes the initial purchase of the backflow preventer, its proper installation, testing and maintenance. Both containment and internal isolation backflow preventers must be tested and maintained in good working condition.

II. INSTALLATION OF REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTERS

Reduced pressure principle backflow preventers will be installed above ground. (Fig. A) The unit should be placed at least twelve inches (12") plus diameter of pipe above the finish grade to allow clearance for repair work. A concrete slab at finish grade is recommended. Proper drainage should be provided for the relief valve and may be piped away from the location, provided it is readily visible from above grade and the relief valve is separated from the drain line by a minimum of double the diameter of the supply line. A modified vault installation may be used if constructed with ample side clearances. (Fig. B) Freezing can be a problem in this area and precautions should be taken to protect above ground installations. (See General Instructions, Page 1)

ABOVE GROUND INSTALLATION

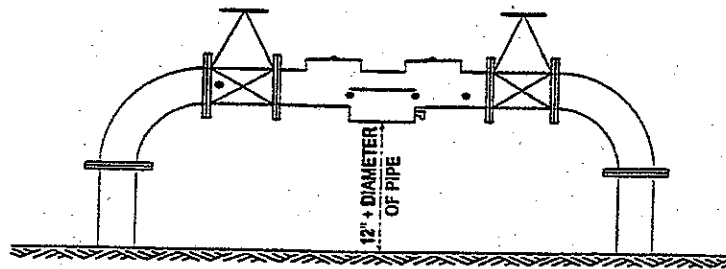


FIG. A

MODIFIED VAULT INSTALLATION

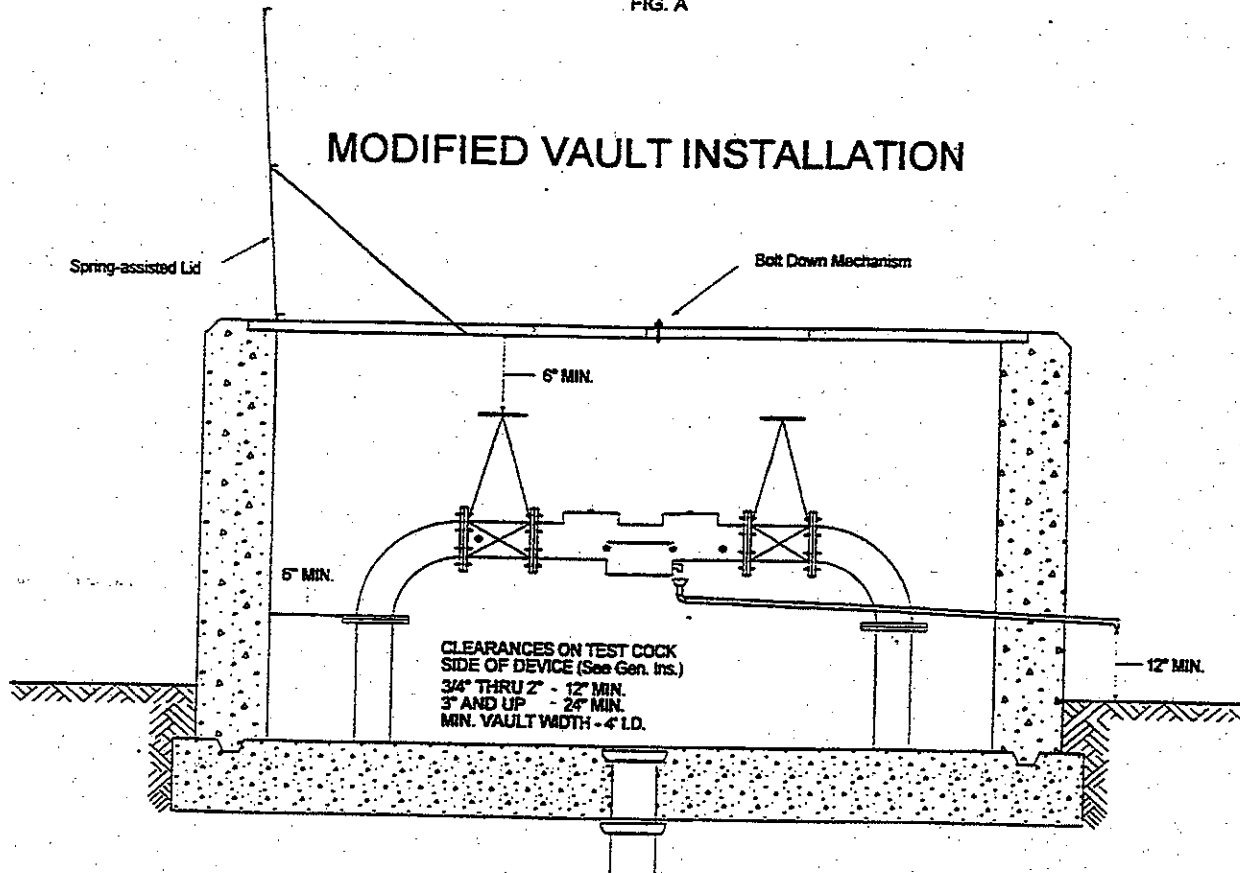
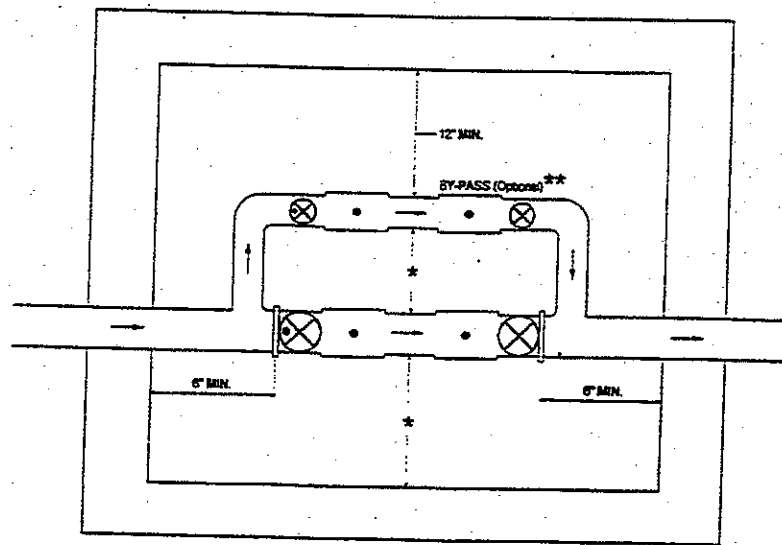


FIG. B

III. INSTALLATION OF DOUBLE CHECK VALVE ASSEMBLY BACKFLOW PREVENTER

Though double check valve assemblies can be installed above ground, these backflow preventers are also readily adaptable for vault installations. Special notice should be given to the side clearances for accessibility to properly test and repair the assembly. Test cocks must be plugged. Plugs must be non-ferrous, e.g. brass, plastic, etc. NOTE SIDE CLEARANCES (Fig. C) (See General Instructions, Page 1)

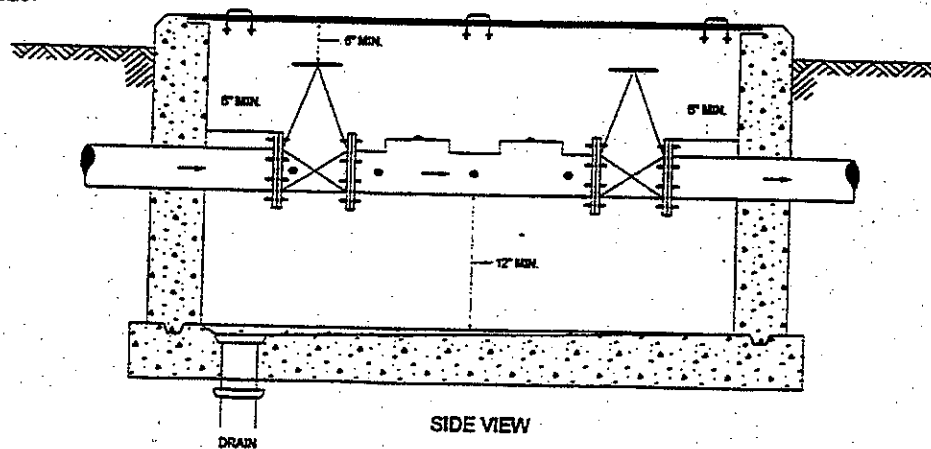
VAULT INSTALLATION



TOP VIEW

CLEARANCES ON TEST COCK
SIDE OF DEVICE (See Gen. Ins.)
3/4" THRU 2" - 12" MIN. *
3" AND UP - 24" MIN.
MIN. VAULT WIDTH 3" AND UP - 4' I.D.

* SEE III A - 3/4" THRU 2"
** SEE V - BY-PASS POLICY



SIDE VIEW

Fig. C

III.A. BELOW GRADE VAULT INSTALLATION OF DOUBLE CHECK VALVE ASSEMBLY

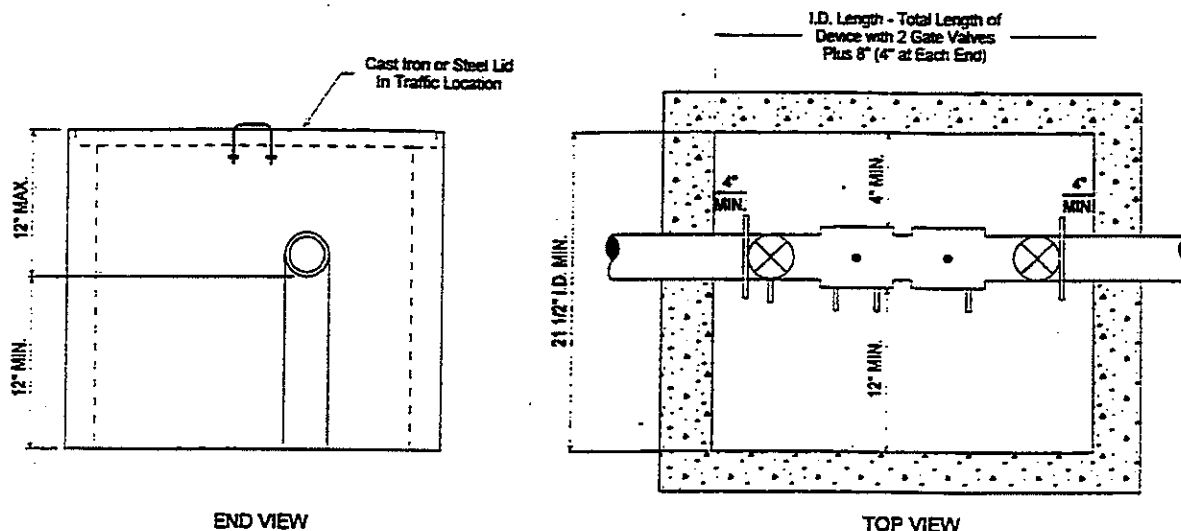
Double check valve assemblies should be installed above grade if possible, but may be installed in below grade vaults when these vaults are properly constructed in accordance with the following guidelines:

I. General - Double Check Valve Assemblies - All sizes

Double check valve assembly backflow preventers, unlike reduced pressure principle assemblies, are designed and readily adaptable for below-grade installations provided they are installed in a vault which is well drained and of solid construction. Vaults within traffic areas should be constructed accordingly. Assemblies must be installed horizontally and in an upright position. Backflow preventers installed in a vertical position or on their side will be disapproved.

II. Double Check Valve Assemblies Sizes 3/4" through 2"

Backflow preventers of sizes two inches and less should not be installed more than 12" below grade for accessibility during testing and repair. To accommodate the installation of most double check valve assemblies up to and including two inch sizes, a vault constructed of concrete, steel, cast iron or other durable material conforming to the dimensions described below is acceptable provided a twelve inch (12") clearance is maintained on the test cock side of the assembly (see General Instructions No. 4), a four inch (4") clearance on non-test cock side and a four inch (4") clearance between the two gate valves and the ends of the vault. Exception: On 1" or smaller double check valve assemblies that are repairable from the top, have test cocks on top of the assembly and not installed in cement or asphalt, the side clearance can be reduced to 4", see General Instructions, No. 4. The floor of the vault shall be either of solid construction with a drain or bottomless to facilitate drainage. In order to facilitate repair of Y-pattern assemblies, a twelve inch (12") clearance must be provided below the assembly. Rigid construction must extend to the floor of the vault.



VI.

AIR GAP SEPARATION

An air gap separation means the unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture or other device and the flood level or overflow rim of the receptacle. An "approved air gap separation" shall be at least double the diameter of the supply pipe measured vertically above the overflow rim of the vessel and in no case shall the gap be less than 1". The tank should be installed as close to the property line as practical. The piping between the water meter and the air gap separation should be entirely visible to insure that no connections or tees are made in that area. To eliminate possible entrance of vermin, screened protections over the entire A/G set-up are encouraged. (See General Instructions, Page 1)

AIR GAP SEPARATION

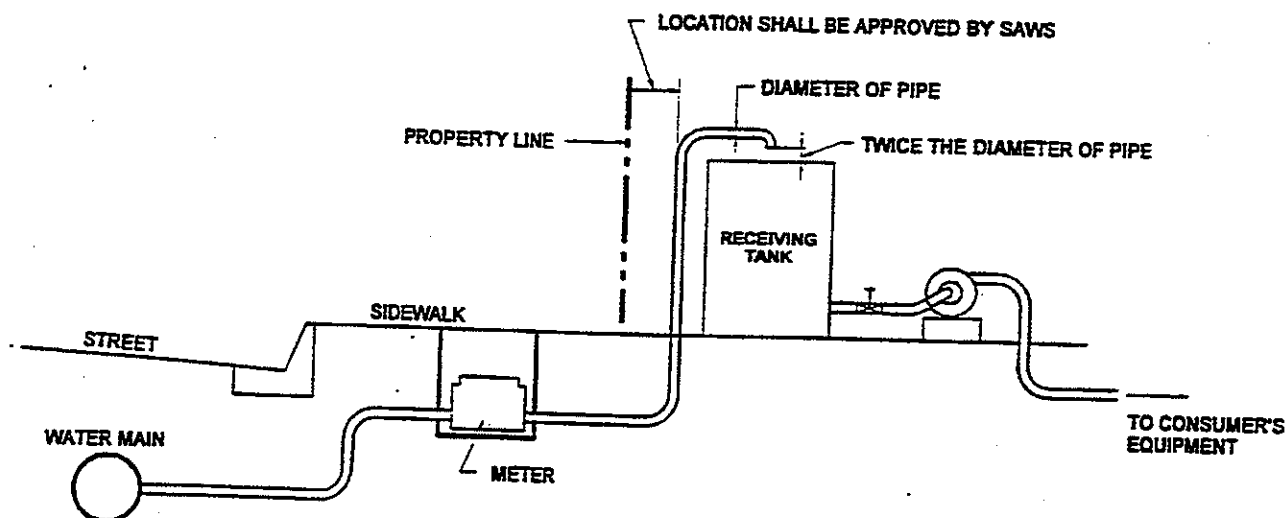


FIG E.

VII. **LAWN SPRINKLER INSTALLATION USING A PRESSURE TYPE VACUUM BREAKER AS A BACKFLOW PREVENTER**

Pressure type vacuum breakers may be installed without regards to down stream valving, making it possible to isolate an entire lawn sprinkler system with a single unit when properly located. This assembly must not be installed where it will be subject to back pressures and should be installed at least twelve inches (12") above the highest outlet. The vacuum breaker should be installed where it will be accessible for periodic testing and where, if slight spillage should occur, it would not be objectionable. (Fig. F) (See General Instructions, Page 1) If chemical additives are to be used, an air gap separation or reduced pressure principle assembly will be required.

LAWN SPRINKLER INSTALLATION

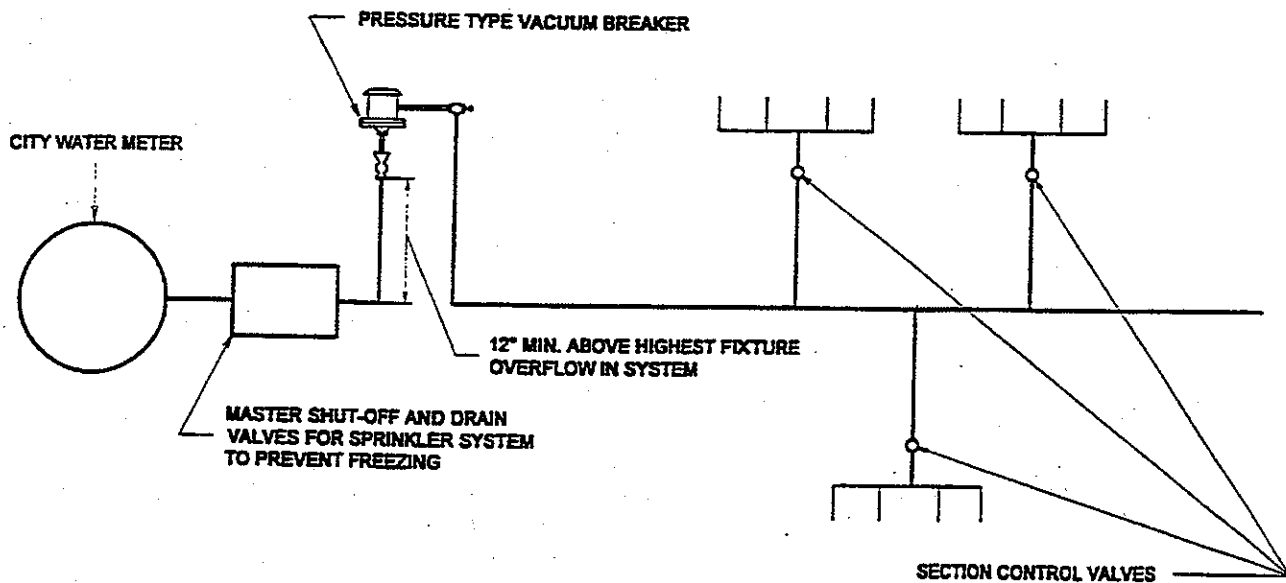


FIG F.